1.011 Project Evaluation
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Quiz Review # 1

Part I Introduction to CEE Projects

Chapter 1: Introduction to Engineering Economy

Basic principles of engineering economy.

Crossing the isthmus of Panama - an example of a series of ever more complex projects seeking similar objectives. The nature, successfulness, and consequences of the projects changed dramatically over time as technology, political interests, and world trade evolved.

Development of roads, canals, railroads, and paved highways allowed much faster or cheaper transportation, which had a marked effect on regional growth, prices of goods, and location of cities, industries, and families.

Part II Life Cycle Costs

Chapter 2: Cost Concepts and Design Economics

Basic cost terminology: fixed and variable costs, marginal costs, incremental costs, opportunity costs, sunk costs etc.

Breakeven volume required for selecting a technology with higher fixed cost, but lower variable cost.

Choosing production volume so as to maximize profit; range of volume for which production is profitable; breakeven volume required to achieve profitability.

Using cost and revenue functions to optimize design or operations (cost-driven optimization); present economy.

Chapter 3: Money Time Relationships and Equivalence

Time value of money.

Equivalence of cash flows; present value of an arbitrary stream of cash flows; equivalence of present worth, future worth, annual worth.

Use of equivalence relationships to compare various options related to cash flows:

- How many years will I need to make $X in order to justify my investment?
- Will a return of $X per year beginning at the end of year 3 be sufficient to justify investing $Y right now?
- If I pay my mortgage payment of $X per year for N years, how much will I still owe after I make the Nth payment, assuming interest rate is I% and the mortgage is for M years?

Discrete and continuous compounding of interest.

Differences among discount rates that should be used in an analysis, interest rates that might be charged by a bank, and the minimum acceptable rate of return that you should use in evaluating your projects.

Risk-return trade off, as perceived by markets and as perceived by the developer.